![Chipsmall logo]

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Reference Only

CHIP COIL (CHIP INDUCTORS)   LQW2BAS□□□□00L   REFERENCE SPECIFICATION

1.Scope

This reference specification applies to LQW2BAS_00 Series Chip coil(Chip Inductors).

2.Part Numbering

(ex)	L Q	W	2 B	A	S	2 N 8	J	O	O	L
	Product ID	Structure	Dimension (L×W)	Applications and Characteristics	Category	Inductance	Tolerance	Features	Electrode	Packaging L:Taping *B:BULK

*Bulk packing also available. (A product is put in the plastic bag under the taping conditions.)

3.Rating

・Operating Temperature Range.   –55°C ~ +125°C
・Storage Temperature Range.   –55°C ~ +125°C

Customer Part Number	MURATA Part Number	Inductance		Q	DC Resistance	Self Resonant Frequency	Rated Current
		(nH)	Tolerance	(min.)	(Ω max.)	(MHz min.)	(mA)
	LQW2BAS2N8J00L	2.8	J : ±5%	80	0.06	12200	800
	LQW2BAS3N0J00L	3.0		65	0.06	12200	800
	LQW2BAS5N6J00L	5.6	J : ±5%	65	0.08	5900	600
	LQW2BAS6N8J00L	6.8		50	0.11	5600	600
	LQW2BAS7N5J00L	7.5		50	0.14	4800	600
	LQW2BAS8N2G00L	8.2		50	0.12	4400	600
	LQW2BAS8N2J00L						
	LQW2BAS10NG00L	10		60	0.10	4300	600
	LQW2BAS10NJ00L						
	LQW2BAS12NG00L	12		60	0.15	4000	600
	LQW2BAS12NJ00L						
	LQW2BAS15NG00L	15	G : ±2%	50	0.17	3200	600
	LQW2BAS15NJ00L		J : ±5%				
	LQW2BAS18NG00L	18		50	0.20	3100	600
	LQW2BAS18NJ00L						
	LQW2BAS22NG00L	22		55	0.22	2600	500
	LQW2BAS22NJ00L						
	LQW2BAS24NG00L	24		50	0.22	2400	500
	LQW2BAS24NJ00L						
	LQW2BAS27NG00L	27		55	0.25	2580	500
	LQW2BAS27NJ00L						
	LQW2BAS33NG00L	33		60	0.27	2150	500
	LQW2BAS33NJ00L						
	LQW2BAS36NG00L	36		55	0.27	1900	500
	LQW2BAS36NJ00L						
	LQW2BAS39NG00L	39		60	0.29	2000	500
	LQW2BAS39NJ00L		G : ±2%				
	LQW2BAS43NG00L	43	J : ±5%	60	0.34	1800	500
	LQW2BAS43NJ00L						
	LQW2BAS47NG00L	47		60	0.31	1700	500
	LQW2BAS47NJ00L						
	LQW2BAS56NG00L	56		60	0.34	1600	500
	LQW2BAS56NJ00L						
	LQW2BAS68NG00L	68		60	0.38	1500	500
	LQW2BAS68NJ00L						

Customer Part Number	MURATA Part Number	Inductance		Q (min.)	DC Resistance (Ω max.)	Self Resonant Frequency (MHz min.)	Rated Current (mA)
		(nH)	Tolerance				
	LQW2BAS82NG00L	82			0.42	1330	400
	LQW2BAS82NJ00L						
	LQW2BAS91NG00L	91		65	0.48		
	LQW2BAS91NJ00L						
	LQW2BASR10G00L	100			0.46	1250	
	LQW2BASR10J00L						
	LQW2BASR11G00L	110			0.48	1100	400
	LQW2BASR11J00L						
	LQW2BASR12G00L	120			0.51		
	LQW2BASR12J00L		G : ±2%				
	LQW2BASR15G00L	150	J : ±5%	50	0.56	920	
	LQW2BASR15J00L						
	LQW2BASR18G00L	180			0.64		
	LQW2BASR18J00L						
	LQW2BASR22G00L	220			0.70	820	
	LQW2BASR22J00L						
	LQW2BASR24G00L	240		44	1.00	770	350
	LQW2BASR24J00L						
	LQW2BASR27G00L	270		48		730	
	LQW2BASR27J00L						
	LQW2BASR33G00L	330			1.40	650	310
	LQW2BASR33J00L						
	LQW2BASR39J00L	390			1.50	600	290
	LQW2BASR47J00L	470	J : ±5%	33	1.76	300	250
	LQW2BASR56J00L	560			1.90	270	230
	LQW2BASR68J00L	680		23	2.20	250	190
	LQW2BASR82J00L	820			2.35	230	180

4. Testing Conditions

《Unless otherwise specified》

Temperature : Ordinary Temperature / 15°C to 35°C
Humidity   : Ordinary Humidity   / 25%(RH) to 85%(RH)

《In case of doubt》
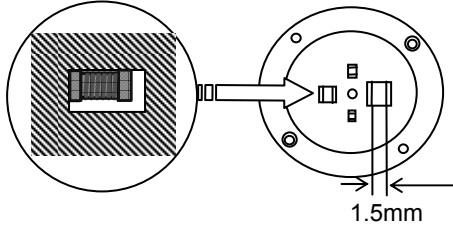
Temperature   : 20°C±2°C
Humidity   : 60%(RH) to 70%(RH)
Atmospheric Pressure : 86kPa to 106 kPa

5. Appearance and Dimensions

2.09±0.2

1.53±0.2

1.42±0.1

0.25±0.15

1.5±0.2

■Unit Mass (Typical value)
0.014g

(in mm)

0.5±0.1

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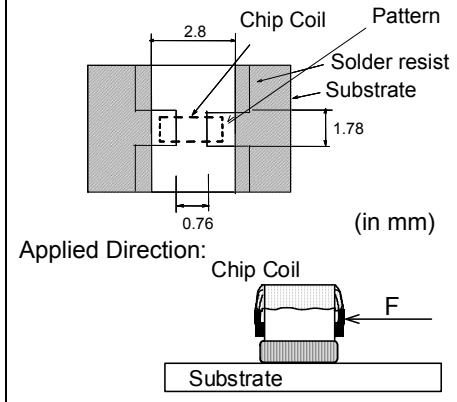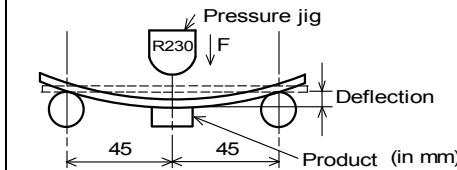
6.Electrical Performance

No.	Item	Specification	Test Method
6.1	Inductance	Inductance shall meet item 3.	Measuring Equipment: KEYSIGHT 4287A or equivalent
6.2	Q	Q shall meet item 3.	Measuring Frequency: <Inductance> 250MHz/2.8nH～39nH 200MHz/43nH～68nH 150MHz/82nH～120nH 100MHz/150nH～390nH 50MHz/470nH 25MHz/560nH～820nH <Q> 1500MHz/2.8nH～3.0nH 1000MHz/5.6nH～8.2nH 500MHz/10nH～100nH 250MHz/110nH～390nH 100MHz/470nH 50MHz/560nH～820nH Measuring Condition: Test signal level / about 0dBm Electrode spaces / 2.0 mm Electrical length / 10.0mm Weight / about 1N~3N Measuring Fixture: KEYSIGHT 16197A Position coil under test as shown in below and contact coil with each terminal by adding weight. 1.5mm Measuring Method: See the endnote. <Electrical Performance:Measuring Method of Inductance/Q>
6.3	DC Resistance	DC Resistance shall meet item 3.	Measuring Equipment:Digital multi meter
6.4	Self Resonant Frequency(SRF)	S.R.F shall meet item 3.	Measuring Equipment: KEYSIGHT 8753C or equivalent
6.5	Rated Current	Self temperature rise shall be limited to 40°C max.	The rated current is applied.

7.Mechanical Performance

No.	Item	Specification	Test Method
7.1	Shear Test	Chip coil shall not be damaged after tested as test method.	Substrate:Glass-epoxy substrate Chip Coil Pattern 2.8 Solder resist Substrate 1.78 0.76 (in mm) Applied Direction: Chip Coil F Substrate Force:10N Hold Duration:5s±1s
7.2	Bending Test	Chip coil shall not be damaged after tested as test method.	Substrate:Glass-epoxy substrate (100mm × 40mm × 1.0mm) Speed of Applying Force:1mm / s Deflection:3mm Hold Duration:5s Pressure jig R230 F Deflection 45 45 Product (in mm)

7.3	Vibration	Chip coil shall not be damaged after tested as test method	Oscillation Frequency:
			     10Hz~2000Hz~10Hz for 15 min
			Total amplitude 3 mm or Acceleration
			amplitude 196m/s^2 whichever is smaller.
			Time : A period of 2 hours in each of
			         3 mutually perpendicular directions.
			(Total 6hours)

7.4	Solderability	The wetting area of the electrode shall be at least 90% covered with new solder coating.	Flux:Ethanol solution of rosin,25(wt)%
			     Includes activator equivalent to 0.06(wt)%
			     chlorine.(immersed for 5s to 10s)
			Solder:Sn-3.0Ag-0.5Cu
			Pre-Heating:150°C±10°C / 60s to 90s
			Solder Temperature:240°C±5°C
			Immersion Time:3s±1s

7.5	Resistance to Soldering Heat	Appearance:No damage
		Inductance Change: within ±5%
			Flux:Ethanol solution of rosin,25(wt)%
			     Includes activator equivalent to 0.06(wt)%
			     Chlorine.(immersed for 5s to 10s)
			Solder:Sn-3.0Ag-0.5Cu
			Pre-Heating:150°C±10°C / 60s to 90s
			Solder Temperature:270°C±5°C
			Immersion Time:10s±1s
			Then measured after exposure in the room condition for 24h±2h.

8.Environmental Performance

It shall be soldered on the substrate.

No.	Item	Specification	Test Method
8.1	Heat Resistance	Appearance:No damage Inductance Change: within ±5% Q Change: within ±20%	Temperature:125°C±2°C Time:1000h (+48h,0h) Then measured after exposure in the room condition for 24h±2h.
8.2	Cold Resistance		Temperature:-55°C±2°C Time:1000h (+48h,-0h) Then measured after exposure in the room condition for 24±2 h.
8.3	Humidity		Temperature:85°C±2°C Humidity:85%(RH) Time:1000h (+48h,-0h) Then measured after exposure in the room condition for 24h±2h.

8.4	Temperature Cycle		1 cycle:
			  1 step:-55°C±2°C / 30min±3 min
			  2 step:Ordinary temp. / 10min to 15 min
			  3 step:+125°C±2°C / 30min±3 min
			  4 step:Ordinary temp. / 30min±3 min
			Total of 10 cycles
			Then measured after exposure in the room condition for 24h±2h.

9.Specification of Packaging

9.1 Appearance and Dimensions of plastic tape (8mm-wide, 4mm-pitch)
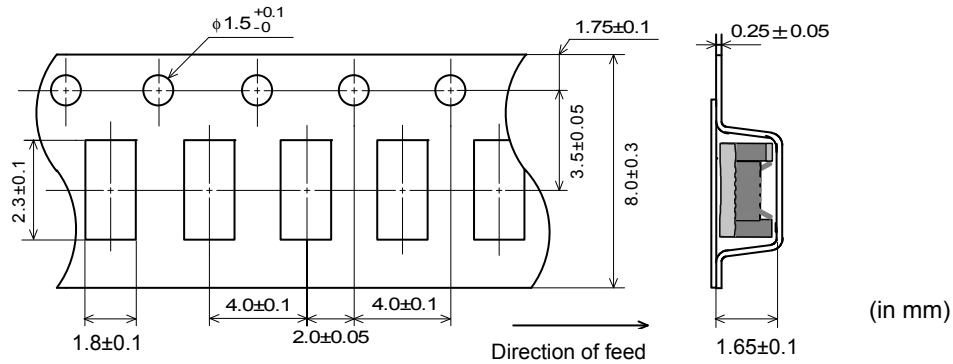
·Dimension of the Cavity is measured at the bottom side.

9.2 Specification of Taping

(1) Packing quantity (standard quantity)
    2,000 pcs. / reel
(2) Packing Method
    Products shall be packed in the cavity of the plastic tape and sealed by Cover tape.
(3) Sprocket hole
    The sprocket holes are to the right as the tape is pulled toward the user.
(4) Spliced point
    Plastic tape and Cover tape has no spliced point.
(5) Missing components number
    Missing components number within 0.1% of the number per reel or 1 pc., whichever is greater,
    and are not continuous. The Specified quantity per reel is kept.

9.3 Pull Strength

Plastic tape	5N min.
Cover tape	10N min.

9.4 Peeling off force of cover tape

Speed of Peeling off	300mm/min
Peeling off force	0.1N to 0.6N (minimum value is typical)

165 to 180 degree F Cover tape

Plastic tape
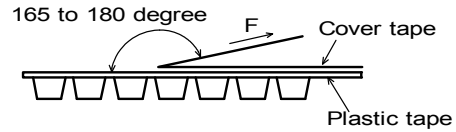
9.5 Dimensions of Leader-tape,Trailer and Reel

There shall be leader-tape (cover tape and empty tape) and trailer-tape (empty tape) as follows.

Trailer
160 min.
2.0±0.5
Label

Leader
190 min.   210 min.
Empty tape   Cover tape

φ13.0±0.2

φ60 $^{+1}_{-0}$

Direction of feed

(in mm)

9.0 $^{+1}_{-0}$

φ21.0±0.8

13.0±1.4

φ180 $^{+0}_{-3}$
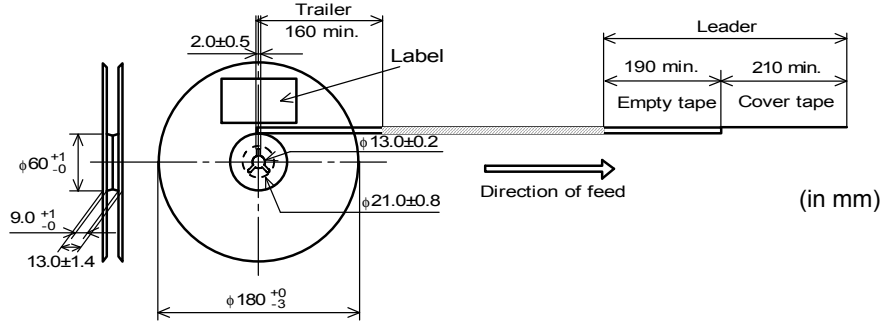
9.6 Marking for reel

Customer part number, MURATA part number, Inspection number(∗1) , RoHS Marking (∗2), Quantity etc ・・・

∗1) <Expression of Inspection No.>   □□ OOOO ×××
                                         (1) (2) (3)
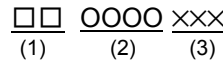
(1) Factory Code
(2) Date   First digit   : Year / Last digit of year
               Second digit   : Month / Jan. to Sep. → 1 to 9, Oct. to Dec. → O, N, D
               Third, Fourth digit : Day
(3) Serial No.

∗2) <Expression of RoHS Marking >   ROHS – Y (△)
                                               (1) (2)
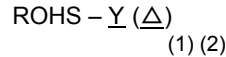
(1) RoHS regulation conformity parts.
(2) MURATA classification number

9.7 Marking for Outside package (corrugated paper box)

Customer name, Purchasing order number, Customer part number, MURATA part number,
RoHS Marking (∗2) ,Quantity, etc ・・・

9.8. Specification of Outer Case

Label

H

D

W
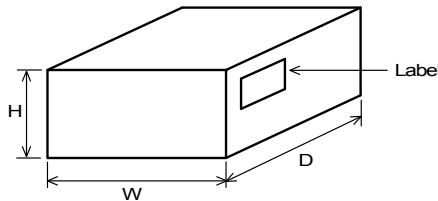
Outer Case Dimensions (mm)			Standard Reel Quantity in Outer Case (Reel)
W	D	H	
186	186	93	5

∗ Above Outer Case size is typical. It depends on a quantity of an order.

10. ⚠ Caution

Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

(1) Aircraft equipment   (6) Transportation equipment (vehicles, trains, ships, etc.)
(2) Aerospace equipment   (7) Traffic signal equipment
(3) Undersea equipment   (8) Disaster prevention / crime prevention equipment
(4) Power plant control equipment (9) Data-processing equipment
(5) Medical equipment   (10) Applications of similar complexity and /or reliability
                                       requirements to the applications listed in the above

Reference Only

11. Notice

Products can only be soldered with reflow.
This product is designed for solder mounting.
Please consult us in advance for applying other mounting method such as conductive adhesive.

11.1 Land pattern designing

Recommended land patterns for reflow soldering are as follows:
These have been designed for Electric characteristics and solderability.
Please follow the recommended patterns. Otherwise, their performance which includes electrical performance or solderability may be affected, or result to "position shift" in soldering process.

(in mm)
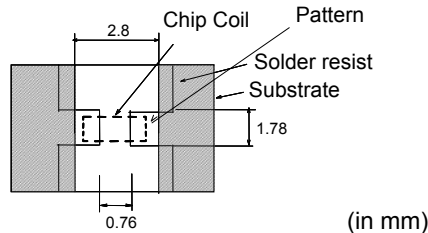
11.2 Flux, Solder

・Use rosin-based flux.
　Includes middle activator equivalent to 0.06(wt)% to 0.1(wt) % Chlorine.
　Don't use highly acidic flux with halide content exceeding 0.2(wt) % (chlorine conversion value).
　Don't use water-soluble flux.
・Use Sn-3.0Ag-0.5Cu solder.
・Standard thickness of solder paste : 100μm to 150μm.

11.3 Reflow soldering conditions

・Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150°C max. Cooling into solvent after soldering also should be in such a way that the temperature difference is limited to 100°C max.
　Insufficient pre-heating may cause cracks on the product, resulting in the deterioration of products quality.

・Standard soldering profile and the limit soldering profile is as follows.
　The excessive limit soldering conditions may cause leaching of the electrode and / or resulting in the deterioration of product quality.

・Reflow soldering profile
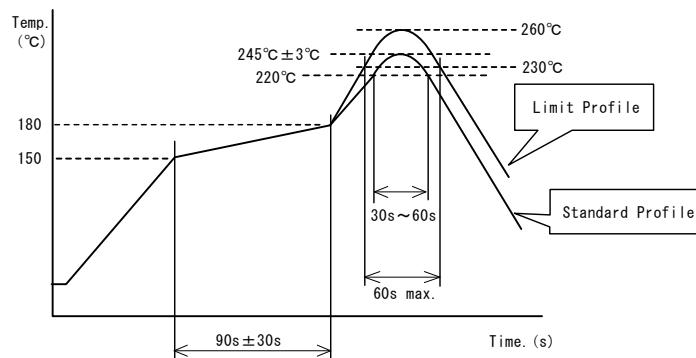
	Standard Profile	Limit Profile
Pre-heating	150°C〜180°C 、90s±30s	
Heating	above 220°C、30s〜60s	above 230°C、60s max.
Peak temperature	245°C±3°C	260°C,10s
Cycle of reflow	2 times	2 times

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11.4 Reworking with soldering iron.
The following conditions must be strictly followed when using a soldering iron.

Pre-heating	150°C,1 min
Tip temperature	350°C max.
Soldering iron output	80W max.
Tip diameter	Φ･3mm max.
Soldering time	3(+1,-0)s
Times	2 times

Note : Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the products due to the thermal shock.

11.5 Solder Volume
・ Solder shall be used not to be exceed the upper limits as shown below.
・ Accordingly increasing the solder volume, the mechanical stress to Chip is also increased.
　Exceeding solder volume may cause the failure of mechanical or electrical performance.

Upper Limit
Recommendable(t) $1/2T \leq t \leq T$
T：thickness of electrode
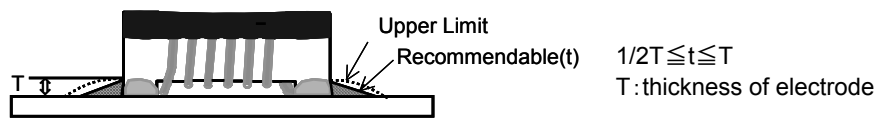
11.6 Product's location
The following shall be considered when designing and laying out P.C.B.'s.

(1) P.C.B. shall be designed so that products are not subject to the mechanical stress due to warping the board.

［Products direction］

〈Poor example〉　　〈Good example〉
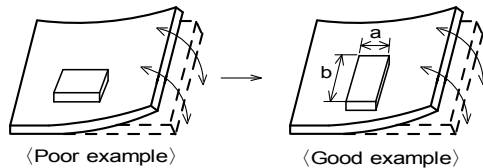
Products shall be located in the sideways direction (Length:a＜b) to the mechanical stress.

(2) Components location on P.C.B. separation.
It is effective to implement the following measures, to reduce stress in separating the board.
It is best to implement all of the following three measures; however, implement as many measures as possible to reduce stress.

Contents of Measures	Stress Level
(1) Turn the mounting direction of the component parallel to the board separation surface.	A ＞ D *1
(2) Add slits in the board separation part.	A ＞ B
(3) Keep the mounting position of the component away from the board separation surface.	A ＞ C
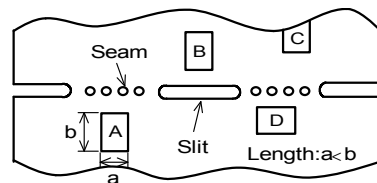
*1 A ＞ D is valid when stress is added vertically to the perforation as with Hand Separation.
If a Cutting Disc is used, stress will be diagonal to the PCB, therefore A ＞ D is invalid.

(3) Mounting Components Near Screw Holes
  When a component is mounted near a screw hole, it may be affected by the board deflection that occurs during the tightening of the screw. Mount the component in a position as far away from the screw holes as possible.
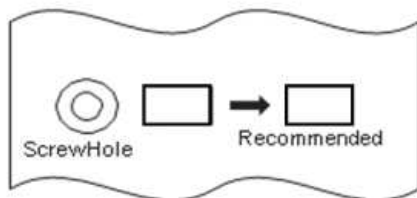
11.7 Cleaning Conditions
   Products shall be cleaned on the following conditions.

   (1) Cleaning temperature shall be limited to 60°C max.(40°C max for IPA)
   (2) Ultrasonic cleaning shall comply with the following conditions with avoiding the resonance phenomenon at the mounted products and P.C.B.
         Power : 20 W / l max.   Frequency : 28kHz to 40kHz   Time : 5 min max.
   (3) Cleaner
         1. Alcohol type cleaner
            Isopropyl alcohol (IPA)

         2. Aqueous agent
            PINE ALPHA ST-100S
   (4) There shall be no residual flux and residual cleaner after cleaning.
       In the case of using aqueous agent, products shall be dried completely after rinse with de-ionized water in order to remove the cleaner.
   (5) Other cleaning   Please contact us.

11.8 Resin coating
   The inductance value may change due to high cure-stress of resin to be used for coating/molding products.
   An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating condition etc. Some resin contains some impurities or chloride possible to generate chlorine by hydrolysis under some operating condition may cause corrosion of wire of coil, leading to open circuit.
   So, please pay your careful attention when you select resin in case of coating/molding the products with the resin.
   Prior to use the coating resin, please make sure no reliability issue is observed by evaluating products mounted on your board.

11.9 Caution for use
   ・Sharp material such as a pair of tweezers or other material such as bristles of cleaning brush , shall not be touched to the winding portion to prevent the breaking of wire.
   ・Mechanical shock should not be applied to the products mounted on the board to prevent the breaking of the core.

11.10 Notice of product handling at mounting
   In some mounting machines,when picking up components support pin pushes up the components from the bottom of plastic tape. In this case, please remove the support pin. The support pin may damage the components and break wire.
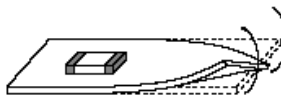
11.11 Handling of a substrate
   After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting to the substrate when cropping the substrate, inserting and removing a connector from the substrate or tightening screw to the substrate.
   Excessive mechanical stress may cause cracking in the product.
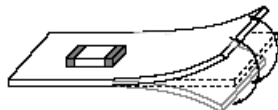
Bending   Twisting

11.12 Storage and Handing Requirements

 (1) Storage period

  Use the products within 12 months after delivered.

  Solderability should be checked if this period is exceeded.

 (2) Storage conditions

  ・Products should be stored in the warehouse on the following conditions.

   Temperature ： -10°C to 40°C

   Humidity   ： 15% to 85% relative humidity   No rapid change on temperature and humidity

  ・Don't keep products in corrosive gases such as sulfur,chlorine gas or acid, or it may cause
   oxidization of electrode, resulting in poor solderability.

  ・Products should not be stored on bulk packaging condition to prevent the chipping of the
   core and the breaking of winding wire caused by the collision between the products.

  ・Products should be stored on the palette for the prevention of the influence from humidity,
   dust and so on.

  ・Products should be stored in the warehouse without heat shock, vibration, direct sunlight and
   so on.

 (3) Handling Condition

  Care should be taken when transporting or handling product to avoid excessive vibration or
  mechanical shock.

12. ⚠ Note

 (1)Please make sure that your product has been evaluated in view of your specifications with our product being
  mounted to your product.

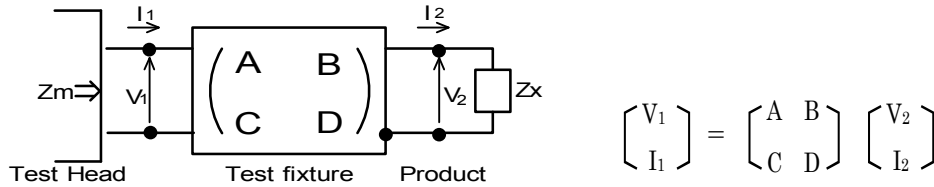 (2)You are requested not to use our product deviating from the reference specifications.

 (3)The contents of this reference specification are subject to change without advance notice.
  Please approve our product specifications or transact the approval sheet for product specifications
  before ordering.

<Electrical Performance:Measuring Method of Inductance/Q>

To keep compatibility to other vender's product, Inductance and Q value shall be measured in following method.

1) Residual elements and stray elements of test fixture can be described by F-parameter shown in following.

$$\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} A & B \\ C & D \end{bmatrix} \begin{bmatrix} V_2 \\ I_2 \end{bmatrix}$$

(2) The impedance of chip coil Zx and measured value Zm can be described by input/output current/voltage.

$$Zm = \frac{V_1}{I_1} \quad , \quad Zx = \frac{V_2}{I_2}$$

(3) Thus,the relation between Zx and Zm is followin

$$Zx = \alpha \frac{Zm - \beta}{1 - Zm\,\Gamma}$$

Where, $\alpha = D/A = 1$
$\beta = B/D = Zsm - (1 - YomZsm)\,Zss$
$\Gamma = C/A = Yom$

Zsm:measured impedance of short chip
Zss:residual impedance of short chip (=equivalent series Inductance X)
Yom:measured admittance when opening the fixture

Important: X:Zss shall be defined as correction value to fit nominal inductance of other venders' products.
Please input X value instead of equivalent series Inductance (ShortL) on test equipment calibration.

(4) Lx and Qx shall be calculated with the following equation.

$$Lx = \frac{Im(Zx)}{2\pi f} \quad , \quad Qx = \frac{Im(Zx)}{Re(Zx)} \qquad f : \text{Measuring frequency}$$

Inductance and Q value shall be measured after this calibration setting.
In addition, Q value should be measured under our standard calibration setting of residual impedance, 0.771nH.

Reference Only

Chart.   equivalent series Inductance to fit nominal inductance of other venders' products.

MURATA Part Number	Inductance	
	X [nH] equivalent series Inductance	Measuring Frequency
LQW2BAS2N8_00	0.171	250
LQW2BAS3N0_00	0.131	250
LQW2BAS5N6_00	-0.009	250
LQW2BAS6N8_00	0.301	250
LQW2BAS7N5_00	-0.299	250
LQW2BAS8N2_00	0.271	250
LQW2BAS10N_00	-0.229	250
LQW2BAS12N_00	0.371	250
LQW2BAS15N_00	0.051	250
LQW2BAS18N_00	-0.029	250
LQW2BAS22N_00	0.491	250
LQW2BAS24N_00	-0.389	250
LQW2BAS27N_00	0.931	250
LQW2BAS33N_00	0.481	250
LQW2BAS36N_00	0.531	250
LQW2BAS39N_00	0.771	250
LQW2BAS43N_00	-0.689	200
LQW2BAS47N_00	1.091	200
LQW2BAS56N_00	0.331	200
LQW2BAS68N_00	0.811	200
LQW2BAS82N_00	-0.839	150
LQW2BAS91N_00	-1.339	150
LQW2BASR10_00	0.171	150
LQW2BASR11_00	1.371	150
LQW2BASR12_00	-1.629	150
LQW2BASR15_00	-0.029	100
LQW2BASR18_00	4.071	100
LQW2BASR22_00	0.771	100
LQW2BASR24_00	3.071	100
LQW2BASR27_00	-1.429	100
LQW2BASR33_00	4.071	100
LQW2BASR39_00	0.971	100
LQW2BASR47_00	-8.829	50
LQW2BASR56_00	-8.229	25
LQW2BASR68_00	-2.229	25
LQW2BASR82_00	-8.029	25